

What is claimed is:

1. A mammalian cell having a plurality of steroid receptor response elements in an array such that the response element can be directly detected when bound by fluorescently labeled steroid receptor.
2. The cell of claim 1, wherein the response element is integrated into the genome of the cell.
3. The cell of claim 1, wherein the response element is present in the mouse mammary tumor virus long terminal repeat.
4. The cell of claim 3, wherein the cell is a cell of the cell line designated 3134 deposited with American Type Culture Collection under accession number CRL-11998 (ATCC).
5. The cell of claim 1, further comprising a nucleic acid encoding a chimeric protein wherein a fluorescent protein is fused to the steroid receptor.
6. The cell of claim 5, wherein the nucleic acid is integrated into the genome of the cell.
7. The cell of claim 5, wherein the fluorescent protein is green fluorescent protein.
8. The cell of claim 5, wherein the steroid receptor is glucocorticoid receptor.
9. The cell of claim 8, wherein the chimeric protein has the amino acid sequence set forth in SEQ ID NO: 2.
10. A method of screening for a compound that binds to a selected nucleic acid comprising:
 - a. contacting compound fluorescently labeled by a fluorescent protein with a cell having a plurality of copies of the nucleic acid in an array such that the nucleic

acid can be directly detected when bound by fluorescently labeled compound;
and

b. directly detecting the location of fluorescence within the cell,
fluorescence aggregated at the site of the nucleic acid array indicating a compound that binds
to the selected nucleic acid.

11. The method of claim 10, wherein the compound is fluorescently labeled with a green
fluorescent protein.

12. The method of claim 10, wherein the selected nucleic acid is integrated into the
genome of the cell.

13. A method of screening for a ligand that activates gene targeting of a steroid receptor
in the nucleus of a mammalian cell comprising:

- a. contacting the ligand with the cell of claim 5; and
- b. directly detecting the location of fluorescence within the cell,

fluorescence aggregated at the site of the steroid receptor response element array in the
nucleus indicating a ligand that activates the gene targeting of a steroid receptor in the
nucleus of a mammalian cell.

14. The method of claim 13, wherein the fluorescent protein is green fluorescent protein.

15. The method of Claim 13, wherein the cell is a cell of the cell line designated 3134
deposited with American Type Culture Collection under accession number _ CRL-
11998 (ATCC).

16. A method of screening for a ligand that activates the translocation of a steroid
receptor to the nucleus in a mammalian cell comprising:

- a. contacting the cell of claim 5 with the ligand; and
- b. directly detecting the location of fluorescence within the cell,

a change in the relative fluorescence of the nucleus to the cytoplasm such as to increase the fluorescence of the nucleus indicating a ligand that activates the translocation of a steroid receptor to the nucleus in a mammalian cell.

17. The method of claim 16, wherein the fluorescent protein is green fluorescent protein.
18. The method of claim 16, wherein the mammalian cell is a cell of the cell line designated 3134 deposited with American Type Culture Collection under accession number CRL-11998 (ATCC).
19. A method of detecting in a biological sample the presence of an agonist of a steroid receptor comprising:
 - a. contacting the sample with the cell of claim 5 and
 - b. directly detecting the location of fluorescence within the cell,the location of fluorescence aggregated at the site of the steroid receptor response element array in the nucleus indicating the presence of an agonist of the steroid receptor in the sample.
20. The method of claim 19, wherein the fluorescent protein is green fluorescent protein.
21. The method of claim 19, wherein the cell is a cell of the cell line designated 3134 deposited with American Type Culture Collection under accession number CRL-11998 (ATCC).
22. A method of detecting in a biological sample the presence of an antagonist of a steroid receptor comprising:
 - a. contacting the sample and an agonist of the steroid receptor with the cell of claim 5 ; and
 - b. directly detecting the location of fluorescence within the cell,

the absence of fluorescence substantially aggregated at the site of the steroid receptor response element array in the nucleus indicating the presence of an antagonist of the steroid receptor in the sample.

23. The method of claim 22, wherein the fluorescent protein is green fluorescent protein.

24. The method of claim 22, wherein the cell is a cell of the cell line designated 3134 deposited with American Type Culture Collection under accession number CRL-11998 (ATCC).

25. A method of monitoring the level of an agonist of a steroid receptor in a subject comprising:

- a. periodically obtaining a biological sample from the subject,
- b. contacting the sample with the cell of claim 5, and
- c. directly detecting the location of fluorescence within the cell,

a decrease in fluorescence aggregated at the site of the steroid receptor response element in the nucleus in a later-obtained sample relative to an earlier-obtained sample indicating a decrease in level of the steroid agonist of the steroid receptor in the sample and an increase in fluorescence aggregated at the site of the steroid receptor response element in the nucleus in a later-obtained sample relative to an earlier-obtained sample indicating an increase in level of the steroid agonist of the steroid receptor in the sample.

26. The method of claim 25, wherein the fluorescent protein is green fluorescent protein.

27. The method of claim 25, wherein the cell is a cell of the cell line designated 3134 deposited with American Type Culture Collection under accession number CRL-11998 (ATCC).

28. A method of monitoring the balance between levels of an agonist of a steroid receptor and an antagonist of the steroid receptor in a subject comprising:

- a. periodically obtaining a biological sample from the subject,

- b. contacting the sample with the cell of claim 5, and
- c. directly detecting the location of fluorescence within the cell,

an increase in fluorescence aggregated at the site of the steroid receptor response element in the nucleus in a later-obtained sample relative to an earlier-obtained sample indicating an increase in level of the steroid agonist relative to level of the steroid antagonist in the sample, and a decrease in fluorescence aggregated at the site of the steroid receptor response element in the nucleus in a later-obtained sample relative to an earlier-obtained sample indicating an increase in level of the steroid antagonist of the steroid receptor relative to level of the steroid agonist in the sample.

29. A method of determining an effective dosage of a steroid receptor agonist in a subject comprising:

- a. transferring into a set of cells from the patient a nucleic acid encoding a chimeric protein comprising a fluorescent protein fused to a steroid receptor;
- b. contacting the cells in the set with one of a selected range of dosages of the steroid agonist; and
- c. directly detecting location of fluorescence in the set of cells,

a dosage capable of locating fluorescence substantially in the nucleus indicating an effective dosage of steroid receptor agonist.

30. The method of claim 28, wherein the fluorescent protein is green fluorescent protein.

31. A method of determining an effective dosage of a steroid receptor agonist to maintain steroid receptor activation for a selected period of time in a subject comprising:

- a. administering to the subject a dosage of the steroid receptor agonist,
- b. periodically obtaining a biological sample from the subject,
- c. contacting the sample with the cell of claim 5, and
- d. directly detecting the location of fluorescence within the cell,

a dosage that maintains the location of fluorescence at the site of the steroid receptor response element array in the nucleus for the selected period of time indicating an effective dosage.

32. The method of claim 31, wherein the fluorescent protein is green fluorescent protein.
33. The method of claim 31, wherein the cell is a cell of the cell line designated 3134 deposited with American Type Culture Collection under accession number CRL-11998 (ATCC).
34. A method of determining an effective dosage of a steroid receptor antagonist to abrogate agonist activity for a selected period of time in a subject comprising:
 - a. administering to the subject a dosage of the steroid receptor agonist,
 - b. periodically obtaining a biological sample from the subject,
 - c. contacting the sample with the cell of claim 5, and
 - d. directly detecting the location of fluorescence within the cell,
 - e. a dosage that prevents the location of fluorescence at the site of the steroid receptor response element array in the nucleus for the selected period of time indicating an effective dosage.
35. The method of claim 34, wherein the fluorescent protein is green fluorescent protein.
36. The method of claim 34, wherein the cell is a cell of the cell line designated 3134 deposited with American Type Culture Collection under accession number CRL-11998 (ATCC).
37. A method of detecting a defect in a response pathway of a steroid receptor in a subject comprising transferring into a cell from the subject a nucleic acid functionally encoding a chimeric protein comprising a fluorescent protein fused to the steroid receptor and detecting the location of fluorescence within the cell as compared to the location of fluorescence within a normal, control cell transfected with the nucleic acid,
a difference in location of fluorescence within the cell of the subject as compared to location of fluorescence within the normal, control cell indicating a defect in the response pathway of the steroid receptor.

38. A method of determining whether a defect in a response pathway of a steroid receptor in a subject is in translocation of the steroid receptor to a cell nucleus, comprising transferring into a cell from the subject having the defect a nucleic acid functionally encoding a chimeric protein comprising a fluorescent protein fused to the steroid receptor and detecting the location of fluorescence within the cell, the location of fluorescence substantially in the cytoplasm of the cell indicating the defect is in translocation of the steroid receptor to the nucleus.
39. A method of characterizing a ligand's effect on cellular localization of a compound to which the ligand binds in a cell comprising:
- contacting the ligand with a cell having the compound fluorescently labeled by a fluorescent protein and
 - directly detecting the location of fluorescence within the cell,
- the location of fluorescence in the cell indicating the localization effect of the ligand on the compound.
40. A method of determining a binding site for a DNA-binding protein comprising:
- contacting the DNA-binding protein fluorescently labeled by a fluorescent protein with a cell having a plurality of copies of a nucleic acid having a putative binding site in an array such that the putative binding site can be directly visualized when bound by the fluorescently labeled DNA-binding protein, and
 - directly detecting the location of fluorescence within the cell, the presence of fluorescence aggregated at the putative binding site indicating a binding site to which the DNA-binding protein binds.
41. A chimeric protein comprising a fluorescent protein fused to a transcription factor.
42. The protein of claim 41, wherein the transcription factor is a steroid receptor.

43. The protein of claim 41, wherein the fluorescent protein is a green fluorescent protein.
44. The protein of claim 43, wherein the green fluorescent protein is *Aequorea* green fluorescent protein.
45. The protein of claim 43, wherein the green fluorescent protein has a substitution of threonine for serine at amino acid 65.
46. The protein of claim 43, wherein the green fluorescent protein is fused to the transcription factor via a peptide linker.
47. The protein of claim 46, wherein the peptide linker comprises about five glycine-alanine repeating units.
48. The protein of claim 42, wherein the steroid receptor is glucocorticoid receptor and a green fluorescent protein is fused to the amino-terminal end of the glucocorticoid receptor.
49. The protein of claim 48, wherein the glucocorticoid receptor has a substitution of serine for cysteine 656.
50. The protein of claim 49 having the amino acid sequence set forth in SEQ ID NO: 2.
51. An isolated nucleic acid encoding the protein of claim 41.
52. An isolated nucleic acid encoding the protein of claim 42.
53. An isolated nucleic acid encoding the protein of claim 43.
54. An isolated nucleic acid encoding the protein of claim 48.

55. An isolated nucleic acid encoding the protein of claim 50.
56. An isolated nucleic acid encoding the protein of claim 50 having the nucleotide sequence set forth in SEQ ID NO: 1.
57. A cell containing the nucleic acid of claim 51.
58. A cell containing the nucleic acid of claim 55.